

CLAIMS

What is claimed is:

1. A communications riser comprising:

at least two communications devices, each of said communications

5 devices having a differential encoder;

an integrated packet bus having three or more input data signals, one
or more said input data signals being designated for carrying differentially encoded
data; and

10 a controller for communicating data with each of said
communications devices via said communications bus, said controller having a
differential decoder;

wherein said differential encoder encodes a portion of said data for
transmission over said one or more said input data signals being designated for
carrying differentially encoded data, and wherein said differential decoder decodes
15 said portion of said data.

2. The communications system of claim 1, wherein said integrated
packet bus supports a communications protocol including a control slot and at least
one data slot, each said slot having at least two bits, and wherein each of said at
least two bits of said control slot selects which of said at least two bits of said at
20 least one data slot belong to which of said at least two communications devices.

3. The communications system of claim 2, wherein said integrated
packet bus includes two output data signals and four input data signals, and

wherein each of said at least two bits of said control slot selects which of said at least two bits of said at least one data slot, on each of said data signals, belong to which of said at least two communications devices.

4. The communications system of claim 3, wherein said
5 communications protocol includes two control slots, and wherein one of said control slots corresponds to said input data signals and the other of said control slots corresponds to said output data signals.

5. The communications system of claim 2, wherein said integrated packet bus includes three output data signals and three input data signals, and
10 wherein each of said at least two bits of said control slot selects which of said at least two bits of said at least one data slot, on each said data signal, belong to which of said at least two communications devices.

6. The communications system of claim 1, wherein said at least two communications devices include a DSL device, a HomePNA device and a LAN
15 device.

7. The communications system of claim 1, wherein said at least two communications devices include two broadband devices.

8. The communications system of claim 1, wherein said controller has a pull-up coupled to each of said one or more said input data signals being
20 designated for carrying differentially encoded data.

9. The communications system of claim 1, wherein said controller performs a handshake with said integrated packet bus to identify said one or more said input data signals designated for carrying differentially encoded data.

10. An integrated packet bus for data communications between a
5 controller and a communications device, said integrated packet bus comprising:

a receive data clock signal;

a transmit data clock signal;

a receive frame signal;

a transmit frame signal;

10 at least two output data signals; and

at least three input data signals;

wherein at least two or more of said at least three input data signals
are not designated for carrying differentially encoded data and at least one or more
of said at least three input data signals are designated for carrying differentially
15 encoded data.

11. The integrated packet bus of claim 10, wherein said at least one or more input data signals designated for carrying differentially encoded data are clocked at a higher rate than said at least two or more input data signals not designated for carrying differentially encoded data.

20 12. The integrated packet bus of claim 10, wherein said integrated packet bus comprises two output data signals and four input data signals.

13. The integrated packet bus of claim 10, wherein said integrated

packet bus comprises three output data signals and three input data signals.

14. The integrated packet bus of claim 10, wherein said integrated packet bus comprises three output data signals and five input data signals.

15. The integrated packet bus of claim 10, wherein said at least one
5 output data signal carries a control slot having at least two bits and a data slot having at least two bits from said controller to said at least two said communications devices, and wherein each of said at least two bits of said control slot selects which of said at least two bits of said at least one data slot belong to which of said at least two communications devices.

10 16. A communications method for data communications on an integrated packet bus linking a controller and a communications device, said integrated packet bus having one or more input data signals designated for carrying differentially encoded data and two or more input data signals not designated for carrying differentially encoded data, said communications method comprising the
15 steps of:

encoding a first portion of said data using a differential encoding technique;

transmitting said first portion of said data on said one or more input data signals designated for carrying differentially encoded data; and

20 transmitting a second portion of said data on said two or more input data signals not designated for carrying differentially encoded data.

17. The communications method of claim 16, wherein said integrated packet bus links said controller and at least two communications devices, said communications method further comprising the steps of:

transmitting a first control slot having at least two bits; and

transmitting at least one first data slot having at least two bits;

wherein said at least two bits of said first control slot indicate which of said at least two bits of said at least one first data slot belong to which of said at least two communications devices.

18. The communications method of claim 17, wherein said integrated packet bus includes two output data signals, and wherein each of said at least two bits of said first control slot selects which of said at least two bits of said at least one first data slot, on each of said output data signals, belong to which of said at least two communications devices.

19. The communications method of claim 17 further comprising the steps of:

receiving a second control slot having at least two bits; and

receiving at least one second data slot having at least two bits;

wherein said at least two bits of said second control slot indicate which of said at least two bits of said at least one second data slot belong to which of said at least two communications devices.

20. The communications method of claim 17, wherein said at least two communications devices include a DSL device, a HomePNA device and a LAN device.

21. The communications method of claim 17, wherein said at least two
5 communications devices include two broadband devices.

22. The communications method of claim 16 further comprising the steps of:

receiving said first portion of said data on said one or more input data signals designated for carrying differentially encoded data;

10 receiving said second portion of said data on said two or more input data signals not designated for carrying differentially encoded data; and

decoding said first portion of said data using said differential encoding technique.

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